to the *Gartenflora* as recently as February of the present year. Dr. Regel was the recipient of many honours in his adopted country, and he was elected a foreign member of the Linnean Society of London in 1890. This is the second of her few prominent botanists that Russia has lost within a year.

NOTES.

The annual meeting of the Iron and Steel Institute will be held at the Institution of Civil Engineers, 25 Great George Street, London, on Thursday and Friday, May 26 and 27, commencing each day at 10.30 a.m. Sir Frederick Abel, F.R.S., the President, will deliver an address on Thursday, May 26. The following papers will be read and discussed on the same day, as far as time permits:—(1) On experiments with basic steel, by W. H. White, F.R.S., Director of Naval Construction and Assistant-Controller of the Navy; (2) on the production of pure iron in the basic furnace, by Colonel H. S. Dyer, Elswick Works, Newcastle-on-Tyne; (3) on experiments on the elimination of sulphur from iron, by E. J. Ball, and A. Wingham, London; (4) on platinum pyrometers, by H. L. Callendar, London. On Friday, May 27, the following papers will be read and discussed:—(5) On the manufacture and application of chilled cast iron (Gruson's system), by E. Reimers, Technical Director of the Gruson Works, Madgeburg; (6) on valves for open hearth furnaces, by J. W. Wailes, Calderbank, near Glasgow; (7) on the calorific efficiency of the puddling furnace, by Major Cubillo, Trubia Arsenal, Spain; (8) on a practical slide-rule for use in the calculation of blast furnace charges, by A. Wingham, London; (9) notes on fuel, and its efficiency in metallurgic operations, by B. H. Thwaite, Liverpool.

The annual meeting of the Society of German Men of Science and Physicians will be held at Nürnberg from September 12 to 18. At the same time and place there will be a meeting of the German Mathematical Association. In connection with these meetings there will be a mathematical exhibition, including models, drawings, apparatus, and instruments used in teaching and in research in pure and applied mathematics. The project has the support of the Bavarian Government, and those who are organizing the exhibition have secured the co-operation of various competent men of science, and of the mathematical departments of some colleges, besides that of prominent publishers and well-known technical institutions. Space will be granted free of charge to exhibitors.

Prof. Elisha Gray, Chairman of the Committee on the Electrical Congress to be held in connection with the Chicago Exhibition, is about to visit all the important electrical centres in the Old World. He will attend meetings of the different electrical organizations, and hopes to strengthen the interest of European electricians in the Exhibition.

We learn from *Science* that Mr. Timothy Hopkins has made provision for the endowment and maintenance of the seaside laboratory at Pacific Grove recently established under the auspices of the Leland Stanford Junior University. The Hopkins Laboratory will be under the general direction of Profs. Gilbert, Jenkins, and Campbell. It will be open during the summer vacation, and its facilities will be at the disposal of persons wishing to carry on original investigations in biology, as well as of students and teachers. Microscopes, microtomes, and other instruments necessary for investigations will be taken from the laboratories of the University.

The great surgeon Richet has been succeeded in the Paris Academy of Sciences by Dr. Guyon.

The distinguished mycologist, M. Roumeguère, of Toulouse, died on February 29 at the age of sixty-three. He had been for fourteen years sole editor of the quarterly *Revue Mycologique*, and was the author of a number of mycological works, the best-known being "Cryptogame illustrée, Champignons d'Europe," with 1700 illustrations.

An interesting course of lectures is being delivered in connection with the Palestine Exploration Fund. They are being given in the lecture-room of the Royal Medical Society. On Tuesday, Canon Tristram lectured on the natural history of Palestine. The following are the remaining lectures of the course:—May 31, twenty-seven years' work, by Mr. Walter Besant; June 7, the Hittites up to date, by Dr. W. Wright; June 21, the story of a "Tell," by Mr. W. M. Flinders Petrie; June 28, the modern traveller in Palestine, by Canon Dalton.

The members of the Geologists' Association will make an excursion to Down on June 18. The directors will be Mr. W. E. Darwin and Mr. W. Whitaker, F.R.S. Having arrived at Urpington, the party will walk up the valley to Green Street Green, where shells and bones have been found in the gravel that forms the bottom of the dry upper part of the valley of the Cray. The walk will be continued through High Elms Park to Down (3½ miles from the station). From Down a short stroll eastward gives a good view of a fine chalk valley. An opportunity will be taken for examining the clay-with-flints which caps the chalk over the higher grounds. The formation of this clay will be discussed, with a notice of Darwin's remarks thereon, and with reference to other like deposits. The general geology of the district will also be described, and the marked features caused by the clayey covering over the chalk, by the fine escarpment of the lower London Tertiaries, and by the London Clay hills beyond. By permission of Mrs. Darwin, the house and grounds rendered classic as the residence of Charles Darwin (Down House) will be shown to members, and Mr. De B. Crawshay will exhibit specimens of the flint implements that have lately been found over the high grounds of the neighbourhood. Messrs. Allen will exhibit others. The return journey will be made across the Tertiary escarpment at Holwood Park, and then down the dip-slope of the Blackheath Beds, over Hayes Common to Hayes (a walk of four miles).

On Saturday afternoon, May 28, Prof. H. Marshall Ward will begin at the Royal Institution a course of three lectures on some modern discoveries in agricultural and forest botany.

Orchid-lovers find much to admire in the latest of Mr. William Bull's exhibitions. An enthusiastic writer in the *Times* describes Mr. Bull's orchid-house as "at present a dream of beauty."

Early on Tuesday morning some parts of West Cornwall were visited by an earthquake. The *Times* says that in the village of Manaccan, in the Lizard district, the shock was so severe that the villagers almost without exception were awakened from their sleep by the shaking of their beds and the rattling of articles in their rooms. Their houses, too, distinctly shook, and in one case a person who was awakened from his sleep saw the door of his bedroom thrown wide open. At Redruth, some 12 or 15 miles distant, the shock was also felt. At first it was thought there had been an explosion somewhere in the neighbourhood.

During the past week a complete change of weather conditions has taken place over the British Isles. The anticyclone which had lain over the country with such persistency for several weeks showed signs of giving way on the 12th, and during the two following days a large but shallow depression spread over the kingdom from west and north-west, while the wind shifted to south-westward with unsettled and showery weather. The temperature, though cooler, was somewhat high for the time of year, the maxima varying from nearly 60° over Scotland to 65° and 70° over England and Ireland. Solar halos were observed on several days, and thunder was reported from the North Foreland on the 13th. Subsequently the westerly winds increased in force, especially in Ireland, and the sea became rough on our exposed western coasts. Some decrease of temperature also occurred, the maximum readings after Sunday only reaching about 60° in a few places. The conditions have been favourable to rain, but the fall has been slight, except in the north and west, and there is still a large deficiency in nearly all parts of the United Kingdom.

The Royal Meteorological Society has published a third edition of "Hints to Meteorological Observers" (42 pages large octavo). It is pointed out in the preface that meteorological observations, to be of scientific value, must be made on a uniform plan, otherwise the results will not be mutually comparable. The directions given are clear and concise, and the various instruments, both desirable or necessary, for a station of the second order, at which observations are taken at least twice daily, are plainly illustrated. The work also comprises several tables which are essential to the proper reduction of the observations recorded. No one can doubt that, notwithstanding the regulations laid down by several Conferences, there is still want of uniformity, not only when comparing observations of one country with another, but even among the observers of our own country. Take, for instance, the observation of rainfall, temperature, sunshine, cloud, and fog. It would be easy to show that the methods employed by various observers differ considerably, especially as to what constitutes a rainy day and how snow is measured, while the estimation of fog is very uncertain. Sunshine values by various kinds of instruments are hardly comparable *inter se*, and the accurate observation of clouds, whether of height, motion, amount, or description, is undoubtedly difficult, and presents a stumbling-block to many observers. Therefore, we cannot but welcome the exertions of the Meteorological Society to obtain uniformity. The work in question will be found very useful for the purpose, and might perhaps be rendered more so, in future, by the addition of the most approved pictures of clouds, and fuller information as to the importance of their careful observation.

The Report of the Department of Marine (Ottawa) for the fiscal year ended June 1891, contains a report upon the Meteorological Service of Canada for the period extending from October 1, 1890, to October 31, 1891. This Service is divided into two branches: (1) the collection and utilization of observations taken simultaneously for the purposes of weather prediction, and (2) the reduction of observations taken by volunteer observers and others for climatological purposes. The publication of the results obtained from the second division has been continued annually, since the establishment of the Service in 1872; but it is now proposed to deal with the accumulated observations, and to publish them in a serviceable and readable form. This will be the first authoritative Government publication on the climate of Canada; and it will be useful for immigration purposes, and for showing the suitability of the climate, in various localities, for raising agricultural crops. It is expected that the work will require three years to complete. Among the stations in connection with the Canadian Service is one at Bermuda, towards the maintenance of which an annual contribution is paid to the Government of that island, and cable messages are received daily in the interests of the shipping on the Atlantic coast. The Cable Company transmit the messages at half the ordinary rates. Many severe storms have occurred in Canada since the last report, and in each instance warnings were issued from Toronto; of these 80·7 per cent. are stated to have been verified. Warnings of approaching snowstorms were also issued to railways, and it is proposed to extend this service to Manitoba, and as far west as Qu'Appelle.

An excellent paper on "The Art of Internal Illumination of Buildings by Electricity," was read by Mr. W. H. Preece, F.R.S., in the rooms of the Royal Institute of British Architects on Monday evening. In the course of his remarks Mr. Preece noted that the electric light was not always absolutely safe. Security was to be obtained only by good design, perfect materials, first-class workmanship, and rigid inspection. Imperfect materials erected by cheap contractors had led to many disasters. On the other hand, it was stated that no fire had occurred in buildings fitted up under the rules and regulations, and inspected by the officers, of the insurance companies in this country. In Mr. Preece's opinion, everything ought as much as possible to be kept in view, and the conductors ought not to be hidden under wainscots or floors or above ceilings. The glow lamp excited by three watts per candle was at present the most perfect source of domestic light, and when the patent expired—in a year or two—would be obtainable at about one-third of the present price.

Mr. W. B. L. Hamilton, writing in the American journal *Electricity* on "Electricity in the United States Navy," says the latest use of the electric motor in taking the place of human energy in the manipulation of the death-dealing Gatling gun has been found to work with great success. The Crocker-Wheeler Motor Company, at the request of the United States Navy Bureau of Ordnance, constructed a special type of motor, which is attached to the breech of the gun. Hitherto the services of two men have been necessary in the working of these guns—the gunner, whose duty is to train the gun and drop the shot, and another man to operate the crank which sets in motion the mechanism which causes the balls to hail down upon the enemy. The adaptation of the Crocker-Wheeler motor not only does away with the services of the latter, but enables the gunner to train and operate the gun at will by touching an electric button. So completely is the Gatling gun under the control of the gunner, that he is enabled to fire either a single shot, or to fire them at the rate of 1200 per minute.

Science of April 29 prints the following account of a fireball, by C. C. Bayley:—"A telephone wire was supported on cedar posts 20 feet high and 20 rods apart. During August, 1889, we had a thunderstorm, during which there was a sharp and heavy crash. Several of the poles were found to have been struck, and portions to have been taken out through their entire length. One of these portions, of the size of a medium rail, was thrown into an adjoining field some rods from the pole. Portions from the others were smaller and more or less shattered. Near the southernmost pole struck, a family were in a house with doors and windows open, and a luminous ball seemed to leap from the wire, pass through the open door and a window, and pursue its course some rods through the open space behind the house. A boy in the room grasped his thumb and cried out, 'I'm struck,' and Mr. Hewett felt a sensation of numbness in his left arm for some time. A girl seized her shawl and rushed out of the house to chase the ball. She reported that she pursued it some distance, while it bounded lightly along, until it seemed to be dissipated in the air without an explosion. The size of the ball was about that of the two fists, and its velocity about that of a ball thrown by the hand."

We learn, from a Florentine source (*La Nazione*, May 3), that in the spring of the year 1890, Mrs. Zelia Nuttall, of the Peabody Museum of American Archæology and Ethnology, Cambridge, Mass.—whose interesting memoir on "Ancient Mexican Shields" was recently noticed in these columns—recognized the great importance of an anonymous Spanish-Mexican MS. preserved in the National Central Library of Florence.

This MS. has never been published. It is entitled "Libro de la vida que los Yndios antiguamente hazian, y supersticiones y malos ritos que tenian y guardavan" (*MSS. Magl.*, Class III., Pal. II, Cod. 3). It treats of the costumes and religious rites of the ancient Aztecs, and is full of coloured designs which Mrs. Nuttall has had reproduced in *fac-simile* by photographic lithography. It is her intention to publish this MS., at her own cost, accompanied by a preface, an English translation of the text, and illustrative notes. It will be dedicated to the approaching Congress of Americanists, which will be held in Spain this autumn to celebrate the fourth centenary of the discovery of America. An edition of 200 copies will be issued, and held on sale at the Peabody Museum of American Archæology.

AN interesting paper on the uses and applications of aluminium was read by Mr. G. L. Addenbrooke before the Society of Arts on May 11, and is printed in the current number of the Society's Journal. Referring to the applicability of aluminium to opera and field glasses, he said there was an example on the table of a glass made in 1864, which had ever since been in constant use. In 1870 the wheel of a carriage passed over it, but it was afterwards straightened out and made usable. It has made two voyages across the Atlantic, two across the Pacific, and has had other shorter experiences of the sea air, besides lying on one occasion for some time in salt water. Mr. Addenbrooke has kept strips of aluminium for two or three weeks in salt water, and has noted very little effect.

TOWARDS the end of last year—from November 21 to December 5—the members of the Victoria Field Naturalists' Club made an excursion to the Australian chains of hills called the Grampians. The excursion seems to have been remarkably pleasant, but the scientific results did not quite come up to the expectation. According to an account given in the Club's Journal, the botanists were far and away the most successful. A really good collection of plants of the district was obtained. In bird life there was little observable that is not so elsewhere nearer Melbourne; neither was there any great variety of snakes or lizards, and to the collectors of these, as also to the entomologist, the excursion was especially disappointing. From the well-known extensive variety of flowering shrubs in the Grampians, coupled with the fact that several are peculiar to the district, it was fully expected that at least a few clearly representative Lepidoptera or Coleoptera would be secured, but not a specimen of either family was seen that is not common in and around Melbourne.

MR. E. H. PARKER, the British Consul at Kiungchow, in Hainan, a large island off the southern coast of China, mentions a curious phenomenon in connection with the tides of that port. The tides inside the inner harbour, he says, require several years of careful observation before they can be tabulated. It appears certain, however, that there are always two tidal waves a day, though one is so much more considerable than the other that the effect is often practically that of one single tide in the twenty-four hours. The easterly and westerly currents through the straits are not necessarily connected with the rise and fall of the water, either there or in port. The phenomenon of "slack water" (*morte eau*) is also observable every ten days or so at Haiphong, and is probably owing to much the same causes as at Hoihow. At Tourane in Tonquin, too, it is popularly thought that there is usually but one tide within the twenty-four hours. This tide is felt away up to the citadel of Quangnam. In the Gulf of Tonquin the incoming tidal wave flows from the south, a fact which perhaps accounts for the singular circumstance that the westerly current in the Hainan Straits always sets for sixteen hours. One at least of the tidal waves from the east which pass Hoihow cannot get through the straits to Tonquin so soon as that portion of the same wave which takes a circuitous course by way of Annam.

THE Pacific Coast Fisheries of the United States appear to be in a most flourishing condition. According to a recent census bulletin, they employed 13,850 persons in various capacities in the last federal census year; 6,498,239 dollars were invested in them, and the products were valued at 6,387,803 dollars. The canning of salmon is the most important fishery industry in the Pacific States.

SISAL grass, according to a Mexican authority quoted in the new number of the *Board of Trade Journal*, is likely to prove a very important source of wealth for Mexico. It grows in long, narrow blades, often to the length of four or five feet, and these, when dry, curl up from side to side, forming a flexible string, stronger than any cotton cord of the same size ever manufactured. It is in great demand among florists and among manufacturers of various kinds of grass goods; and it is said to be capable of being applied to many new uses. Ropes, cords, lines of any description and any size may be manufactured of it, and a ship's cable of sisal grass is one of the possibilities of the future. It is almost impervious to the action of salt water, and is not readily decayed or disintegrated by moisture and heat. It takes its name from the port of Sisal, in Yucatan, through which it was formerly exported.

A PAPER on modern aërial navigation was read by Captain J. D. Fullerton, R.E., before the Royal United Service Institution on Friday last. His object was to show that the science of aëronautics was based upon simple rules and common sense, and not upon wild and vague theories opposed to all principles of nature. He divided aërial navigation into two distinct branches: (1) ballooning, or navigation by means of machines lighter than air; and (2) aëration, or navigation by means of machines heavier than the air. Proceeding to discuss the first branch, the lecturer sketched the history of attempts at propelling balloons. Describing the requirements of a proposed war balloon, he said these were: (1) that it should be able to carry three or four passengers, a supply of explosive shells, and a machine gun or two; (2) that it should be able to travel at the rate of about 30 miles an hour on a still day, which would enable it to keep up with almost any warship afloat. In regard to aëration, Captain Fullerton said the chief characteristics of this system were that a large supporting surface, either in the form of wings or in that of an aëroplane, was used to carry the weight; that the lifting or supporting power of this surface was dependent upon its velocity and the angle of inclination which it made with the horizon; and that the horizontal resistance to motion depended upon the velocity and angle of inclination in the same manner. The great difficulty both in ballooning and aëration was to get a sufficiently light motor.

THE first number of a new journal, called the *Canal Journal*, has been issued. Its aim will be "to assist the cause of canals and inland navigation generally." It promises to be of considerable value and interest to the class of readers for whom it is especially intended.

THE German publisher, Friedrich Brandstetter, announces that he will issue in the course of the present year a second and improved edition of Dr. J. J. Egli's "Nomina Geographica." The number of explained names has been much more than doubled.

FURTHER details concerning the nature and chemical behaviour of acetyl fluoride, CH_3COF, the new substance whose preparation and physical properties were described in our note of last week (p. 40), are contributed by M. Meslans to the current number of the *Comptes rendus*. It may be remembered that this interesting substance was shown to be liquid at temperatures below 19°·5, and gaseous at temperatures superior to this, its temperature of ebullition, both the liquid and the gas being colourless, and endowed with an odour somewhat reminding one of that of carbonyl chloride. In contact with water, acetyl fluoride is found to react eventually in a manner similar to its well-known analogue, acetyl chloride, forming hydrofluoric and acetic acids.

$$CH_3.COF + H_2O = CH_3.COOH + HF.$$

But there is a considerable difference in the degree of energy with which the decomposition occurs, for while the behaviour of acetyl chloride is almost violent, acetyl fluoride only reacts with great slowness. When a small quantity of the fluoride if dropped into water the two liquids do not mix, and the globule of fluoride only disappears after long standing. Strong solutions of potash or soda, however, decompose it rapidly, with formation of fluoride and acetate of the alkali. The action of caustic lime upon acetyl fluoride is interesting; the gas is rapidly absorbed by it, and calcium fluoride and acetic anhydride formed.

$$2CH_3.COF + CaO = CaF_2 + (CH_3.CO)_2O.$$

Ammonia gas reacts with considerable energy with the liquid, producing a white crystalline mass, consisting of ammonium fluoride and acetamide, $CH_3.CONH_2$. The latter may readily be isolated in good crystals by extraction with ether and subsequent evaporation. The gaseous fluoride reacts with ammonia in the proportion indicated by equation—

$$CH_3.COF + 2NH_2 = CH_3.CONH_2 + NH_4F;$$

that is, two volumes of ammonia react with one volume of acetyl fluoride gas. Aniline likewise acts with energy upon the liquid, forming hydrofluoric acid and acetanilide, $C_6H_5.NH.CH_3.CO$. The action of absolute alcohol is peculiar; it dissolves the liquid fluoride in all proportions, but after an interval of a few hours, interaction occurs with production of hydrofluoric acid and acetic ether. The latter may readily be separated by the addition of water.

$$CH_3.COF + C_2H_5OH = CH_3.COOC_2H_5 + HF.$$

Acetyl fluoride is much more stable in presence of alkaline acetates than its chlorine analogue. Even after four hours' heating in a sealed tube to 100° with sodium acetate, only a small proportion of sodium fluoride and acetic anhydride were formed. Still more stable is acetyl fluoride towards sodium amalgam, there being no appreciable reduction to aldehyde or alcohol. Metallic sodium is likewise without action upon liquid acetyl fluoride, but when heated to redness in the gaseous fluoride, the metal decomposes it with incandescence, sodium fluoride being formed and carbon deposited, together with a few drops of a liquid whose characters have not yet been ascertained. From these reactions it is evident that acetyl fluoride is a substance of a much more stable character than its analogue, acetyl chloride.

THE additions to the Zoological Society's Gardens during the past week include an Egyptian Ichneumon (*Herpestes ichneumon*) from North Africa, presented by Dr. J. Anderson; a Ring-tailed Coati (*Nasua rufa*), a Kinkajou (*Cercoleptes caudivolvulus*), a Blue-bearded Jay (*Cyanocorax cyanopogon*) from Brazil, presented by Mr. J. E. Wolfe, C.M.Z.S.; two Laughing Kingfishers (*Dacelo gigantea*), from Australia, presented by Mrs. H. M. Stanley; two Grey Hypocoliuses (*Hypocolius ampelinus* ♂ ♀) from Scinde, presented by Mr. W. D. Cumming; two Ravens (*Corvus corax*), British, presented by Mr. Gregory Haines; a Crowned Horned Lizard (*Phrynosoma coronatum*) from California, presented by Mr. R. Thorn Annan; a Common Fox (*Canis vulpes*), British, three Palm Squirrels (*Sciurus palmarum*) from India, a Brown-throated Conure (*Conurus æruginosus*) from South America, deposited; a Grey-headed Porphyrio (*Porphyrio poliocephalus*) from Persia, purchased; a Persian Gazelle (*Gazella subgutterosa* ♂), a Vulpine Phalanger (*Phalangista vulpina* ♀), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

LATITUDE OBSERVATIONS AT WAIKIKI.—The *Hawaiian Gazette* for March 8 contains an account by Mr. Preston, of the U.S. Coast Survey, of the latitude observations which are being made at Waikiki on the island of Oahu, Hawaii. In it we read:—"The motion of the pole is, of course, extremely small, and the effect is that here in Honolulu we are about 50 feet nearer the equator now than we were some months ago. This change does not, however, go on indefinitely, but the motion is such that the pole returns at the end of a year to nearly its original position. Besides this annual movement, there seems to be reason to believe that there is a secular change extending over a period of at least sixty years." But no definite conclusions can be arrived at until the observations made at Honolulu are discussed in connection with those made on this side of the earth. In order to test the theory that changes of latitude are produced by the movements of large masses of molten matter in the interior of the earth, the force of gravity is measured on every night that latitude observations are made. As this is done with the idea of detecting variations, the relative and not absolute intensity is all that is required. The arrangement employed is such that if from any cause the acceleration due to gravity should be increased by only one five-hundredth of an inch, it could be easily measured. The observations will be completed in the fall of the year, but the final results cannot be known before the latter part of 1893.

MOTION IN THE LINE OF SIGHT.—*Astronomy and Astro-Physics*, No. 104, contains a very important contribution by Mr. W. W. Campbell, on the reduction of spectroscopic observations in the line of sight. The paper contains an explanation of the construction and use of the tables, the limit of precision adopted being one-hundredth of a mile per second. The first table gives the velocities of the star corresponding to a known displacement of one tenth-metre in the various parts of the spectrum, from which the velocity corresponding to any observed displacement can be directly obtained. The formula

$$v_s = V_s \Delta\lambda$$

gives this velocity corresponding to any measured $\Delta\lambda$, V_s being taken directly from the tables.

Table II. gives the earth's orbital velocity, V_a, and the deviation, i, when the sun's longitude is $\odot$. These values are obtained from the formulæ—

$$\tan i = \frac{e \sin(\odot - \Pi)}{1 + e\cos(\odot - \Pi)}$$

and $$V_a = \frac{a}{\sqrt{1-e^2}} \cdot \frac{2\Pi}{T}[1 + e\cos(\odot - \pi)] \sec i,$$

and when found are substituted in the equation—

$$v_a = -V_a \sin(\lambda - \odot + i)\cos\beta.$$

By tabulating V_a and i as functions of $\odot$, their values can be very easily found, and v_a consequently reduced from the last-mentioned equation.

The value of the lunar correction has been taken into account here, omitting any errors due to ellipticity of the orbit and its inclination to the ecliptic. Its value is obtained from the formula—

$$v_d = -0{\cdot}29 \sin t \cos\delta \cos\varphi,$$

the latitude used being that of Mount Hamilton, but corresponding corrections for any other latitudes can be found from these by multiplying them by $\frac{\cos\phi'}{\cos\phi}$, where ϕ' is the new latitude required.

THE LATE PARTIAL ECLIPSE OF THE MOON.—Fine weather was generally prevalent during the partial eclipse of the moon on May 11, affording many observers a good opportunity for noting any new features connected with such an occurrence. Considering that the eclipse was only a partial one, it may be rather difficult to decide whether it should be classed in the category of "bright" or "dark" eclipses. Undoubtedly it was not a very dark one, for during the greatest immersion the whole surface of the moon could be distinctly seen, especially with the help of a telescope, with which craters could be picked out. On the hypothesis that "dark" and "bright" eclipses are brought about owing to the different states of the solar atmosphere, the present one should have been at any rate more inclined to be "bright" than "dark," for as we are approach-